NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 12-2003
APPLICABLE TO INSTRUCTION NWSI 10-310
JULY 31, 2004

Operations and Services
Marine and Coastal Weather Services, NWSPD 10-3
Marine and Coastal Forecast Services, NWSI 10-310

MARINE WEATHER SERVICES

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OPR: W/WR1x4 (J. Lorens) **Certified by:** W/WR1 R. Douglas
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWS Western Region Supplement 12-2003 dated July 31, 2003.

The following changes were made in this issuance:

1. Issuance time windows for CWF and SRF products shortened.
2. Wind gust criteria, mixed swell policy, and headline policy clarified.
3. Allowable wave height ranges increased for higher waves.
4. Combined seas policy revised.
5. References to use of Marine Weather Statement for High Surf Advisories removed.

(1) Regional High Surf Advisory criteria removed.

Signed 07/12/04
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Director, Western Region

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1. Introduction. This regional supplement provides additional guidance and instructions for marine weather products and services including Coastal Waters Forecasts, Surf Zone Forecasts, and Marine Weather Statements. Written instructions cannot address every situation. Operational personnel must exercise initiative and professional judgment to minimize risk to public safety and property in instances when written instructions do not provide appropriate guidance. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property will take precedence in these decision-making processes.

2. Coastal Waters Forecasts (CWF).

2.1 Issuance. Western Region (WR) WFOs use the Interactive Forecast Preparation System (IFPS) to prepare coastal waters forecasts (CWFs) for their marine areas of responsibility. Scheduled issuance times are: 0300/0900/1500/2100 (Local Time). CWFs will be issued no earlier than 30 minutes prior to, but no later than scheduled issuance times. Unscheduled

(updated or corrected) CWFs will be issued as necessary. Gridded marine elements will be updated as needed to ensure currency.

2.2 CWF Format. Refer to NWSI 10-310 (section 2.4):

2.2.1 Combining Forecast Periods. The first forecast period will stand alone (for emphasis on the short term, and to better facilitate short term updates, if required). The second and third forecast periods may be combined if wind, wave, and weather conditions are similar. Any of the forecast periods *beyond third period* may also be combined. Do NOT combine the third and fourth forecast periods, due to the exclusion of swell period in the fourth and later forecast periods.

2.2.2 Reference to National Marine Sanctuaries. WFOs Los Angeles, San Francisco Bay Area, and Seattle will reference National Marine Sanctuaries in their areas of responsibility in the SYNOPSIS description line or in the areal description line of the Mass News Disseminator (MND) (Ref: NWSI 10-302, paragraph 2.3.3 and NWSI 10-302).

2.3 CWF Content.

2.3.1 Synopsis. WR WFOs will include a brief synopsis discussing the dominant weather features affecting the WFO's coastal waters area of responsibility, including general trends (movement, intensification, weakening, etc., as applicable). Primary emphasis will be placed on the first 36-48 hours of the forecast, but weather features expected to result in a significant degradation (or improvement) of forecast conditions beyond 48 hours, particularly wind and/or sea conditions which would pose a significant hazard, should also be mentioned.

2.3.2 Forecast Content.

a. Wind (general). Wind will be included for all forecast periods. A single prevailing wind direction should be used, unless a wind shift is predicted during the forecast period. A small range of wind direction (e.g., 45 degrees, "W-NW") may be used in areas affected by topography (e.g., bays, channels, etc.).

1. Wind Speed. Wind speeds will be rounded to the nearest 5 knots. If a range is used, it will be limited to 10 knots for each marine forecast zone (for example, SW WIND 20 to 30 KT). If wind speeds are expected to exceed this range (for example, due to a rapid increase or decrease), lower and upper bounds should be specified (for example, SE WIND 10 KT INCREASING TO 30 KT).

2. Wind Gusts. Significant differences between sustained winds and peak gusts (10 knots or more) should be included when expected (for example, NW WIND 20 KT GUSTING TO 30 KT), particularly when they cross advisory or warning thresholds. (*Exception:* Inland bays and waters may use larger ranges when appropriate to clearly depict expected conditions).

b. Seas. Seas will be included in the CWF for all forecast periods, as described below. *Exception:* Inland waters and bays are exempted from having detailed sea state predictions and may use a general description of wave conditions, e.g. steep, rough, choppy, etc., when it helps to convey the severity of a given situation.) In WR, inland waters include Puget Sound and Hood Canal, Admiralty Inlet, the Strait of Juan de Fuca, the San Juan Islands (Camano Island to Pt. Roberts), San Francisco Bay, San Pablo Bay, Susuin Bay, and the West Delta (Sacramento/San Joaquin Rivers). For these purposes, the terms "steep" and "rough" refer to situations in which the dominant period (in seconds) is equal to or less than the wave height (in feet). "Choppy" refers to the same criteria, but for wave heights *less than five feet.*

1. Swell direction (direction swell is coming *from*, based on an eight-point compass) will be included for all forecast periods, except as noted in paragraph 2.3.2.b.6. (Combined Seas), below.

2. Swell height (feet) will be included for all forecast periods, except as noted in paragraph 2.3.2.b.6. (Combined Seas), below. A maximum range of 2 feet should be used for heights less than 10 feet. A 3-foot range may be used for heights of 10 feet or higher (e.g. 8 to 11 feet, 15 to 18 feet, etc.). Exceptions: (1) When rapidly building or subsiding trends are forecast, i.e. in a single forecast period, indicate lower and upper bounds for swell height, e.g., W SWELL 7 FT AT 10 SECONDS...BUILDING TO 15 FT and (2) In the vicinity of major points of land, large islands (e.g. Channel Islands), and in open bays (e.g. Monterey Bay), larger ranges may be used as appropriate to describe swell, but should be minimized whenever possible.

3. Swell period will be included during the first three forecast periods (Note: When **combined seas** are used, substitute **dominant period** for swell period). A maximum range of 2 seconds should be used, except when rapid period changes are expected in a single forecast period (for example, W SWELL 8 FT AT 10 SECONDS...BUILDING TO 15 FT AT 17 SECONDS).

4. "Mixed Swell". A secondary swell should also be included if it can be clearly identified. In such cases, specify the predominant swell first (if possible), then the secondary swell. Include a height and period for each swell (in accordance with ranges previously specified). As general guidance, include a secondary swell if it differs from the primary swell by 90 degrees or more, the height of the secondary swell is at least half the height of the primary swell, or if it poses a special hazard (e.g. shoaling in shallower depths due to longer period).

5. Wind wave height (feet) will be included for all forecast periods, except as noted in paragraph 2.3.2.b.6. (Combined Seas), below. A maximum range

of 2 feet should be used, except when rapidly building or subsiding trends are forecast in a single forecast period (for example, WIND WAVES 2 FT...BUILDING TO 4 TO 6 FT).

6. Combined seas (combination of swell height and wind wave height, typically synonymous with **significant wave height**). The term "combined seas" will be substituted for the combination of ***swell height*** and ***wind wave height*** when the two cannot be clearly distinguished. Example situations may include (1) a combination of wind wave and short period swell (also known as "fresh swell") or (2) when several swells are present with no single swell predominant. Forecasters are otherwise discouraged from using "combined seas".

c. Significant Weather / Visibility. Refer to NWSI 10-310, paragraph 2.3.8.c.

2.4 River Bar Forecasts. Certain areas along the Northern California, Oregon, and Washington coasts, known as river bars, are designated as separate marine zones (Ref: NWSI 10-302). These areas often have conditions significantly different from adjacent coastal waters zones. For these designated zones, specific wave forecasts, if available, and/or tidal current information, generally covering the first two forecast periods, may be appended to the appropriate marine zone forecast as shown in the example below.

PZZ210-031630-
COLUMBIA RIVER BAR FORECAST
330 AM PDT THU JUN 3 2004

...SMALL CRAFT ADVISORY FOR ROUGH COLUMBIA RIVER BAR THIS MORNING...

IN THE MAIN CHANNEL...COMBINED SEAS 5 FT THIS MORNING... SUBSIDING TO 4 FT TONIGHT. HOWEVER...SEAS WILL TEMPORARILY BUILD TO 10 FT WITH BREAKERS AROUND THE VERY STRONG EBB CURRENT AT 530 AM THIS MORNING...AND TO 6 FT AROUND THE WEAK EBB AT 6 PM THIS EVENING.

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2.5 Small Craft Advisory Criteria.

2.5.1 Wind Speed Thresholds: 21 to 33 knots (inclusive), sustained and/or frequent gusts. Note: Gusts occurring on a time scale greater than 2 hours are considered "frequent" (Ref: NWSI 10-301, definition of "gust"). WFOs may use up to 25 knots as the lower threshold of this range, based on customer requirements.

2.5.2 Small Craft Advisory for Hazardous Seas (SCAHS): Small Craft Advisories for Hazardous Seas are based on wave height alone, or in conjunction with wave steepness. Wave steepness is defined as "the ratio of wave height to wavelength" (ref: NWSI 10-301). If wave height is used, by itself, the threshold for SCAHS is 10 feet. If wave steepness is used in conjunction with wave height, WFOs will define specific criteria, based on customer requirements, and inform NWS Western Region HQ (MSD) of their criteria (also if criteria changes).

2.6 Effective Periods for Small Craft Advisories, Gale Warnings, Storm Warnings, and Hurricane Force Wind Warnings: WFOs should collaborate closely on issues concerning Small Craft Advisory, Gale Warning, Storm Warning, and/or Hurricane Force Wind Warnings in CWFs. The following guidelines apply:

2.6.1 Small Craft Advisories. Coastal WFOs will issue Small Craft Advisories when criteria are met for the first or second twelve hour period. Issuance of Small Craft Advisories in the second forecast period should be limited to situations in which forecaster confidence is **high**. Additionally, when forecaster confidence is **high** that Small Craft Advisory criteria will be met in the third or later forecast periods, WFOs may include a headline for these *expected* conditions. If such headlines for *expected* conditions are used, the words "CONDITIONS EXPECTED" will be explicitly included in the headline, for example: "…SMALL CRAFT ADVISORY CONDITIONS EXPECTED TUESDAY…".

2.6.2 Gale Warnings, Storm Warnings, and Hurricane Force Wind Warnings. Coastal WFOs will issue Gale/Storm/Hurricane Force Wind Warnings when criteria are met for the first, second, or third twelve hour period. Issuance of Warnings in the third forecast period should be limited to situations in which forecaster confidence is **high**. Additionally, when forecaster confidence is **high** that Gale/Storm/Hurricane Force wind criteria will be met in the fourth or later forecast period, WFOs may include a headline for these *expected* conditions. If such headlines for *expected* conditions are used, the word "EXPECTED" will be explicitly included in the headline, for example: "…GALE FORCE WINDS EXPECTED WEDNESDAY…".

2.7 Unscheduled CWF Issuance. Refer to NWSI 10-310, section 2.4.1.

2.8 Headlines. Use headlines in the CWF to emphasize marine weather (and marine weather-related) events likely to have a significant impact on mariners and/or marine operations. When using headlines, include specific time references (e.g. "…GALE WARNING TONIGHT…". WFOs will limit the total number of headlines in the CWF (each segmented portion) to a maximum of three. WFOs will use the following wording and general order of precedence as guidelines for adding headlines to CWFs:

a. Tsunami Warning
b. Hurricane Force Wind Warning
c. Storm Warning
d. Gale Warning
e. Tsunami Watch
f. Tornado Watch

g. Severe Thunderstorm Watch.
h. Small Craft Advisory
i. Gale (or Storm/Hurricane Wind) Force Winds Expected
j. Small Craft Advisory Conditions Expected

3. Surf Zone Forecasts (SRF). The SRF supplements other public weather products by providing valuable weather and water information unique to the surf zone. The surf zone is defined as the very narrow area of water between the high tide level on the beach and the seaward side of breaking waves.

3.1 Issuance. If rip current outlooks are provided on a routine basis, WFOs will include this information in the SRF, in the format specified below. SRFs will be issued daily at **0200 and 1400 (Pacific Local Time)** and updated when conditions change significantly. The SRF may be issued up to 30 minutes prior to, but not later than the scheduled issuance times. During unusually heavy workload situations, the SRF may be issued up to 1 hour prior to the scheduled issuance time. WFOs which do not routinely provide rip current outlooks may include this information in High Surf Advisories, Coastal Flood Statements/Watches/Warnings (CFW), and the Hazardous Weather Outlook. For WFOs issuing SRFs, High Surf and Coastal Flood events will be headlined in the SRF. Additionally, WFOs issuing SRFs will include a headline whenever the risk of rip currents is "HIGH".

3.2 SRF Format. General format for the SRF is as follows:

FXXX## Kxxx (ISSUANCE DATE TIME ddhhmm)
SRFxxx

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE (CITY)(STATE)
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

(OVERALL AREA COVERED BY THIS FORECAST - optional)

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREAL DESCRIPTOR[S] -
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

...HEADLINE (If needed)...

.Forecast text...

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Forecaster Name (Optional)

See Appendix B for example SRF

3.3 SRF Content. SRFs issued by WR offices will contain the following elements:

a. Surf height (height of breaking waves). For swell information, SRFs may reference the local WFO's Coastal Waters Forecast (CWF) (see Appendix A for example).

b. Rip current risk. Use "LOW" or "HIGH" (reference: NWSI 10-310, paragraph 3.6.1).

c. Water temperature.

3.4 Unscheduled SRF Issuance. WFOs will update the SRF when observed or forecast elements change significantly. As needed, add either "...UPDATED" or "...CORRECTED" to the product header whenever an unscheduled SRF is issued or when an error in the SRF is corrected, respectively. Add a short description of the updated or corrected items just below the areal header to highlight the change:

FXXX## Kxxx (ISSUANCE DATE TIME ddhhmm)
SRFxxx

SURF ZONE FORECAST...**UPDATED (or ...CORRECTED)**
NATIONAL WEATHER SERVICE (CITY)(STATE)
(VALID TIME) AM/PM (PST *or* PDT)(DAY)(DATE)

(OVERALL AREA COVERED BY THIS FORECAST - optional)
(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREAL DESCRIPTOR[S] -
(VALID TIME) AM/PM (PST *or* PDT)(DAY)(DATE)

REASON FOR UPDATE (or CORRECTION) (no ellipses)
...HEADLINE (if necessary)...
.Text

$$
Forecaster Name (Optional)

4. Marine Weather Statements (MWS).

4.1 Issuance. In addition to criteria specified in NWSI 10-314, the MWS may be used to provide more detailed information on significant conditions in a WFO's coastal waters zones beyond 24 hours from the current forecast period (e.g. strong winds, tidal overflows, and hazardous materials spills). Note: The Coastal Flood Statement/Watches/Warning (CFW) will be used for issuing High Surf Advisories (ref: NWSI 10-320); the MWS will no longer be used for this purpose.

4.2 MWS Format. Refer to NWSI 10-314 for MWS Format.

5. Forecast Collaboration. WFOs routinely collaborate with adjacent offices and with the Ocean Prediction Center (OPC), as necessary during the forecast process to facilitate or improve consistency of marine forecasts, watches, warnings, and advisories. Forecasters will use available means for collaboration (chat software, telephone, intersite coordination tools (IFPS/ISC), etc.).

APPENDIX A - Example Surf Zone Forecast

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD CA
200 AM PDT THU APR 15 2003

.FOR THE BEACHES OF SOUTHERN CALIFORNIA…FOR TUE APR 15…

*THE FOLLOWING INFORMATION APPLIES WHEN RIP CURRENT POTENTIAL FORECAST IS "LOW": DUE TO HIGHLY VARIED COASTAL TOPOGRAPHY, DANGEROUS RIP CURRENTS ARE ALWAYS A POSSIBILITY ALONG THE SOUTHERN CALIFORNIA COASTS, AND SWIMMERS ARE URGED TO USE CAUTION AT ALL TIMES.

CAZ039-152100-
VENTURA COUNTY COAST-
200 AM PDT THU APR 15 2003

.TODAY…
SURF HEIGHT*.....2-4 FEET.
RIP CURRENT POTENTIAL.....LOW*
WATER TEMPERATURE.....61-63 DEGREES.

REMARKS…MAX SETS TO 5 FEET.

OUTLOOK FOR WEDNESDAY…DECREASING SWELL AND SURF.

*FOR SWELL INFORMATION REFER TO COASTAL WATERS FORECAST…WMO HEADER FZUS KLOX

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CAZ040-152100-
VENTURA COUNTY COAST-
200 AM PDT THU APR 15 2003

…HIGH RIP CURRENT POTENTIAL TODAY…
…HIGH SURF ADVISORY REMAINS IN EFFECT UNTIL 200 AM WEDNESDAY…

SURF HEIGHT*……..5-8 FEET.
RIP CURRENT POTENTIAL……..HIGH. VERY STRONG CURRENTS AND DANGEROUS SWIMMING CONDITIONS ARE EXPECTED.
WATER TEMPERATURE……..61-64 DEGREES.

REMARKS…MAX SETS TO 9 FEET ON EXPOSED SOUTHWEST FACING BEACHES.

OUTLOOK FOR WEDNESDAY…DECREASING SWELL AND SURF.

*FOR SWELL INFORMATION REFER TO COASTAL WATERS FORECAST…WMO HEADER FZUS KLOX

$$

CAZ041-152100-
LOS ANGELES COUNTY COAST-
200 AM PDT TUE APR 15 2003

…HIGH RIP CURRENT POTENTIAL TODAY…
…HIGH SURF ADVISORY REMAINS IN EFFECT UNTIL 200 AM WEDNESDAY…

SURF HEIGHT*…….……..5-8 FEET.
RIP CURRENT POTENTIAL……..HIGH. VERY STRONG CURRENTS AND DANGEROUS SWIMMING CONDITIONS ARE EXPECTED.
WATER TEMPERATURE……..62-67 DEGREES.

REMARKS…MAX SETS TO 9 FEET ON EXPOSED SOUTHWEST FACING BEACHES.

OUTLOOK FOR WEDNESDAY…DECREASING SWELL AND SURF.

*FOR SWELL INFORMATION REFER TO COASTAL WATERS FORECAST…WMO HEADER FZUS KLOX

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FORECASTER